

REMARKS

Applicant respectfully requests further examination and reconsideration in view of the remarks set forth below. Claims 1-5, 7-9, 12, 17, 18, 20, 27, 32-34, 37-39, 45, 52, 55, and 58-60 were previously pending in this application. In the Advisory Action, Claims 1-5, 7-9, 12, 17, 18, 20, 27, 32-34, 37-39, 45, and 58-60 are rejected. Also within the Advisory Action, Claims 52 and 55 are allowed, and Claims 10, 11, 13-15, 21, 29-31, 35, 36, 40, 42, 43, and 46 are objected to and would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. By the above amendments, Claims 1, 27, 58, 59, and 60 are amended. Each of the rejections is fully addressed below. Accordingly, Claims 1-5, 7-9, 12, 17, 18, 20, 27, 32-34, 37-39, 45, 52, 55, and 58-60 are now pending in this application.

Rejections under 35 U.S.C. § 102

Within the Office Action mailed on September 7, 2004 (hereinafter "Office Action"), Claims 58-60 stand rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,185,535 issued to Hedin et al. (hereafter "Hedin"). The Applicant respectfully traverses this rejection.

The present invention is a system and method for speech recognition using an adaptive multi-pass technique. The system includes an input device coupled to a source of spoken input for receiving the spoken input. A processor coupled to the input device performs a first pass speech recognition technique on the spoken input and forms first pass results. The first pass results can include a number of alternative speech expressions, each having an assigned score representative of the certainty that the corresponding expression correctly matches the spoken input. In the preferred embodiment, scores for alternative expressions and differences between such scores are utilized to determine whether to perform another speech recognition pass.

In one embodiment, the first pass results identify a characteristic of the spoken input. Thereafter, it is determined whether to run a second pass. If a second pass is run, the second

pass speech recognition technique is selected from a plurality of available speech recognition techniques, taking into account the results of the first pass. For example, the characteristic of the spoken input can be the gender of a speaker of the spoken input or a type of telephone channel the speaker is calling from. In which case, the plurality of speech recognition techniques includes one specific to female speakers, one specific to male speakers and one specific to callers via a hands-free telephone. The most appropriate of these speech recognition techniques is selected for the second pass. However, if the first pass is unsuccessful at identifying the characteristic of the spoken input, then multiple ones of the plurality of speech recognition techniques can be selected for the second pass and the their results combined.

Hedin teaches a system in which a single speech recognition technique is used. The single speech recognition technique is performed by a first automatic speech recognition system (ASR) 227, which attempts to recognize an isolated word by mapping the isolated word into a vector space suitable for use by a feature matching and decision unit 231. These feature vectors are matched to other feature vectors provided by a reference database 233. A second ASR 307 performs the same speech recognition technique by mapping feature vectors corresponding to the isolated word and using a feature matching and decision unit 311 to compare these feature vectors with other feature vectors provided by a reference database 313. There is no hint, teaching or suggestion in Hedin that indicates the use of a plurality of speech recognition techniques.

Within the Advisory Action, it is stated that Hedin teaches the user to re-utter the word, thereby performing a second pass of the speech recognition technique. By the above amendments, the independent Claims 58, 59, and 60 are each amended to clarify that the first pass is made according to a first speech recognition technique and that the first speech recognition technique is selected from a plurality of speech recognition techniques. Since Hedin teaches only a single speech recognition technique, the amended independent Claims 58, 59, and 60, which are each directed to a plurality of speech recognition techniques, are allowable over Hedin.

Rejections under 35 U.S.C. § 103

Within the Office Action, Claims 1-5, 7-9, 12, 17, 18, 20, 27, 32-34, 37-39, and 45 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hedin in view of U.S. Patent No. 5,526,463 issued to Gillick et al. (hereafter “Gillick”). The Applicant respectfully traverses this rejection.

Within the Office Action, it is acknowledged that Hedin does not teach limiting a first pass speech recognition to a subset of matches. However, it is suggested that a fast match, or course, recognition technique of Gillick can be used to limit the initial results of Hedin to a shortened list of possible candidates before using the speech recognition system of Hedin. The Applicant contends that such a combination is not the same as the claimed limitations.

Gillick teaches a fast match system in which a first, or course, speech recognition technique is performed on input speech to provide a reduced set of possible matches. This course search is not configured to find a single accurate match, but instead to narrow the match possibilities. The set of possible matches is then sent to a second, or fine, speech recognition system and a more detailed speech recognition technique is performed.

The proposed combination necessitates the use of the Gillick first, or course, speech recognizer to perform a first pass. However, as discussed above, a first pass within Gillick does not result in an accurate, singular match. Using the first speech recognizer of Gillick requires a second pass to achieve an accurate, singular result. In the proposed combination, the second pass is performed by the first or second ASR of Hedin.

In the proposed combination, a first pass is made by Gillick to narrow the output choices, and these output choices are provided to Hedin, which performs a second pass. However, such a configuration requires that the second pass is performed, since the first pass, as performed by Gillick, is not configured to generate a single accurate match. As Gillick is only configured to provide a narrowed set of matches, it is necessary to perform the second pass, using Hedin, in order to generate a single accurate match. In contrast, the present independent Claims 1 and 27 are directed to “selectively perform a second pass speech recognition technique” (emphasis added). The claimed limitations do not require that a second pass is performed.

The amended independent Claim 1 includes a speech recognition system for recognizing spoken input received from a source of the spoken input coupled to the speech recognition system. The speech recognition system comprises input means for receiving the spoken input from the source of the spoken input, and processing means coupled to the input means for performing a first pass according to a first speech recognition technique on the spoken input and for forming first pass results, wherein the first pass results define one or more preliminary matching speech expressions, further wherein the processing means selectively performs a second pass according to a second speech recognition technique on the spoken input according to the first pass results. As described above, the proposed combination of Hedin and Gillick does not teach selectively performing a second pass. For at least these reasons, the independent Claim 1 is allowable over of Hedin in view of Gillick.

Similarly, the amended independent Claim 27 includes a method of recognizing spoken input received from a source of the spoken input. The method comprises receiving the spoken input from the source of the spoken input, performing a first pass according to a first speech recognition technique on the spoken input, forming first pass results, wherein the first pass results define one or more preliminary matching speech expressions, and selectively performing a second pass according to a second speech recognition technique on the spoken input according to the first pass results. As described above, the proposed combination of Hedin and Gillick does not teach selectively performing a second pass. For at least these reasons, the independent Claim 27 is allowable over of Hedin in view of Gillick.

Claims 2-5, 7-9, 12, 17, 18, and 20 are each dependent upon the independent Claim 1. Claims 32-34, 37-39, and 45 are each dependent upon the independent Claim 27. As discussed above, Claims 1 and 27 are each allowable over the teachings of Hedin. Accordingly, Claims 2-5, 7-9, 12, 17, 18, 20, 32-34, 37-39, and 45 are each also allowable as being dependent upon allowable base claims.

Within the Office Action, the independent Claims 52 and 55 are allowed.

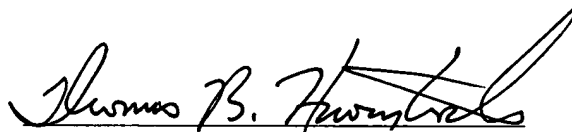
For the reasons given above, the Applicant respectfully submits that all of the claims are now in a condition for allowance, and allowance at an early date would be appreciated. Should the Examiner have any questions or comments, he is encouraged to call the undersigned at (408) 530-9700 to discuss the same so that any outstanding issues can be expeditiously resolved.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Direct Deposit Account No. 18-1275 for any matter in connection with this response, including any fee for extension, which may be required.

Respectfully submitted,
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